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(19)(CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Blowmoulded Cartridge

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(57) 8 Claims

ABSTRACT OF THE DISCLOSURE

An explosives cartridge is manufactured as a blowmoulded tubular shell having formed in the exterior surface thereof one or more integral cylindrical wells adapted to receive and securely retain a corresponding detonator.

BLOWMOULDED CARTRIDGE

BACKGROUND OF INVENTION

(a) Field of Invention

This invention relates to a new or improved blowmoulded cartridge for use in holding an explosive compound and a detonator.

(b) Description of the Prior Art

It is known to provide blowmoulded cartridges in the form of tubular plastic containers to be filled with explosive compounds. In one known cartridge the tubular container is formed with external screwthreads adjacent its opposite ends so that it can be linked to similar cartridges through the use of a tubular threaded connector sleeve whereby a series of explosive cartridges of a length required in a particular blasting application can readily be put together. One of the cartridges is closed at one end by a plastic cap formed with a pair of integral axially extending tubular wells to receive detonators, the tubular wells in the assembled condition of the cartridge extending into the explosive compound which fills the interior of the cartridge. Great difficulty has been experienced in establishing a satisfactory seal between the detonator-carrying cap and the open end of the associated cartridge so that in practice problems are encountered with leakage of water into the explosive compound in the interior of the cartridge, or alternatively leakage of the explosive compound to the exterior of the cartridge.

SUMMARY OF THE INVENTION

The present invention provides a tubular cartridge for carrying an explosive compound, said cartridge comprising

a tubular container having a first end that is sealed by an integral end wall and an opposite circular open end adapted to be sealed by a circular closure after the cartridge has been filled with explosive compound, said cartridge having in an external surface thereof a well that is configured to receive and retain a detonator.

The well preferably comprises a cylindrically formed recess extending axially of the cartridge and opening towards the first end thereof, the recess being formed in the cartridge wall in an integral blowmoulding step. The well is preferably axially extending and part cylindrical in form being arranged adjacent the surface of the tubular container and open to the exterior by a narrow slot of a width less than the diameter of the well so that a detonator placed in the well cannot be removed in the radial direction.

The open second end can be sealed, after the cartridge has been filled with explosive compound, by spin welding a circular cap onto the annular thin-walled open end of the cartridge. The explosive compound is thus integrally sealed within the interior of the cartridge and there is no risk of water seepage or escape of explosive compound.

As before, in use cartridges can be interconnected by screwthreaded sleeves engaging the ends of adjacent cartridges. A detonator can be placed in any one of a series of interconnected cartridges, and the cartridges include grooves on their external surface through which detonator wiring can be led.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will further be described, by way of

example only, with reference to the accompanying drawings wherein:

Figure 1 is an elevational view of an explosive cartridge in accordance with the present invention;

Figure 2 is an enlarged end view of the cartridge taken from the left hand end of Figure 1; and

Figure 3 is an enlarged fragmentary sectional view taken on the line 3-3 in Figure 2.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

The explosive cartridge 10 shown in Figure 1 comprises a sealed impervious tubular container closed at one end by an integrally formed end wall 11, and closed at the opposite end by a circular cap 12. The tubular container is formed by a blowmoulding technique from a suitable plastics material such as polyethylene, polyvinylchloride, polypropylene or any blow grade co-polymer etc. and has a central cylindrical section 13 bounded at opposite ends by annular grooves 14 and having a number of axially extending grooves 15 on the outer side thereof.

Adjacent the closed end 11 the cartridge has a cylindrical section 16 of reduced diameter that is formed with an external screwthread 17 which is interrupted near its inboard end by a detent 18.

Integrally moulded at diametrically opposed locations in the cylindrical wall of the threaded end sections 16 are a pair of cylindrical wells 19, each well having a cylindrically formed wall extending through at least 200° of arc and being open to the exterior through an axially extending slot 20 which is of a constant width that is

substantially less than the internal diameter of the well 19. The opposite end 22 of the well is closed, and of course the interior of the cartridge is completely sealed from the wells 19. Each well is of a length to accommodate any common commercially available detonator which typically are in the range 2 to 3 inches in length and opens at its end adjacent the end 11 in an angled surface 21.

The opposite end of the cartridge likewise comprises a cylindrical end section 24 of the same diameter as the cylindrical end 16 and formed with an identical screwthread 25 which likewise has a detent 26 adjacent the inboard end thereof.

The cartridge 10 is produced by manufacturing the tubular shell (without the closure 12) as a blowmoulding, the wells 19 being formed around axially extending pins in the mould which can be retracted to allow extraction of the moulded shell from the mould dies which have a parting line in a diametral plane of the tubular sleeve.

The tubular sleeve is then filled with the desired explosive compound (not shown) whereafter the closure cap 12 is sealed to the open cylindrical end of the tubular sleeve by spin welding so that the interior of the completed cartridge is hermetically sealed from the exterior and there is no danger of leakage in either direction.

In use, a string of explosive cartridges 10 are interconnected successively axially through the use of internally threaded tubular sleeves (not shown) which have an outer diameter corresponding to that of the tubular section 13 and which likewise are formed with thread detents comple-

mentary to detents 18 and 19 so that when the threaded sleeve is completely engaged with the cartridge threads 17 or 25, the interacting detents engage to retain the thread against accidental disengagement. It will be appreciated that when the cartridges are interconnected in this way, the tubular connector will enclose the well 19 completely, and therefore shield and prevent accidental withdrawal of a detonator (not shown) placed in one of the wells.

Instead of blowmoulding, the cartridge container could be formed by injection moulding, or by any other suitable process.

-WHAT IS CLAIMED IS:

1. A tubular cartridge for carrying an explosive compound, said cartridge comprising a tubular container having a first end that is sealed by an integral end wall and an opposite circular open end adapted to be sealed by a circular closure after the cartridge has been filled with explosive compound, said cartridge having in an external surface thereof a well that is configured to receive and retain a detonator.

2. A cartridge as claimed in claim 1 wherein said well comprises a cylindrically formed recess that extends axially in the wall of the tubular container and opens towards said first end of the cartridge.

3. A cartridge as claimed in claim 2 wherein said well is defined by a cylindrically curved wall integral with the wall of said tubular container, said cylindrically curved wall extending through at least about 200° of arc and being open to the outside through an axially extending slot of predetermined width, said well being designed to receive a detonator having a thickness substantially greater than said width.

4. A cartridge as claimed in claim 1 including integral external screwthreaded formations adjacent both ends thereof, said screwthreaded formations being adapted for engagement by complementary internal screwthreads in a tubular connector through which a pair of such cartridges can be interconnected in axial alignment, said well having an open end at a location

where it will be enclosed by such tubular connector in the interconnected condition of said cartridge.

5. A cartridge as claimed in claim 2 fabricated as a blowmoulded plastics article, said cartridge having at opposite ends thereof integral external screwthreaded formations and also having on the external surface thereof recessed grooves through which detonator wiring can be led.

6. A cartridge as claimed in claim 3 fabricated as a blowmoulded plastics article, said cartridge having at opposite ends thereof screwthreaded formations for engagement by complementary screwthreaded formations of a tubular connector sleeve through which two such cartridges can be interconnected in axial alignment.

7. A cartridge as claimed in claim 2 wherein there are two such wells, said cartridge including external grooves to receive wiring for detonators placed in said wells.

8. An explosive cartridge comprising a tubular cartridge as claimed in claim 1, the interior of said container being filled with an explosive compound, and the open second end of the container being sealed by a closure spin-welded to the circular edge of the opposite end of said container.

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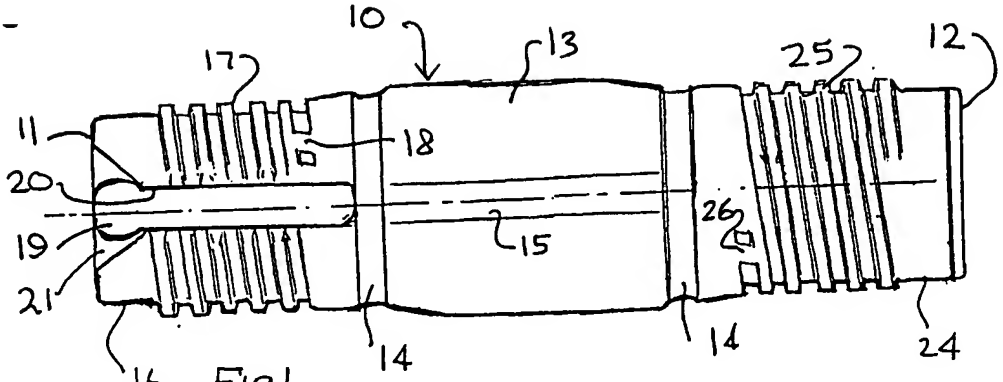

Fig1

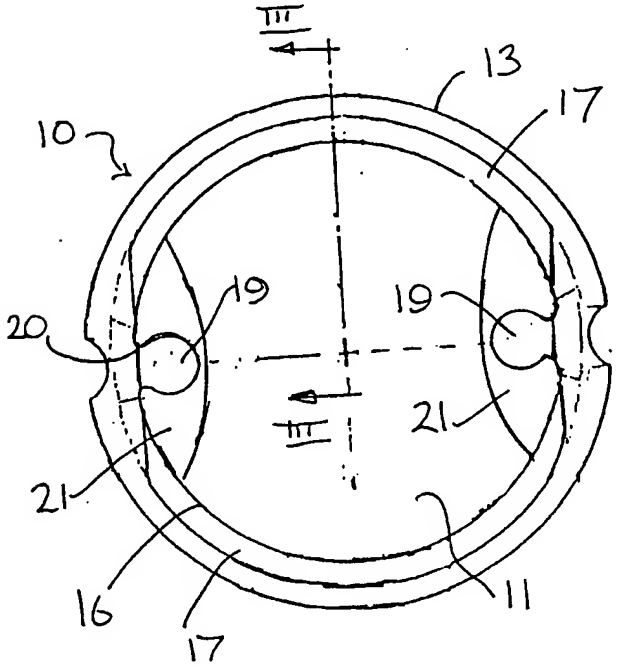

Fig 2

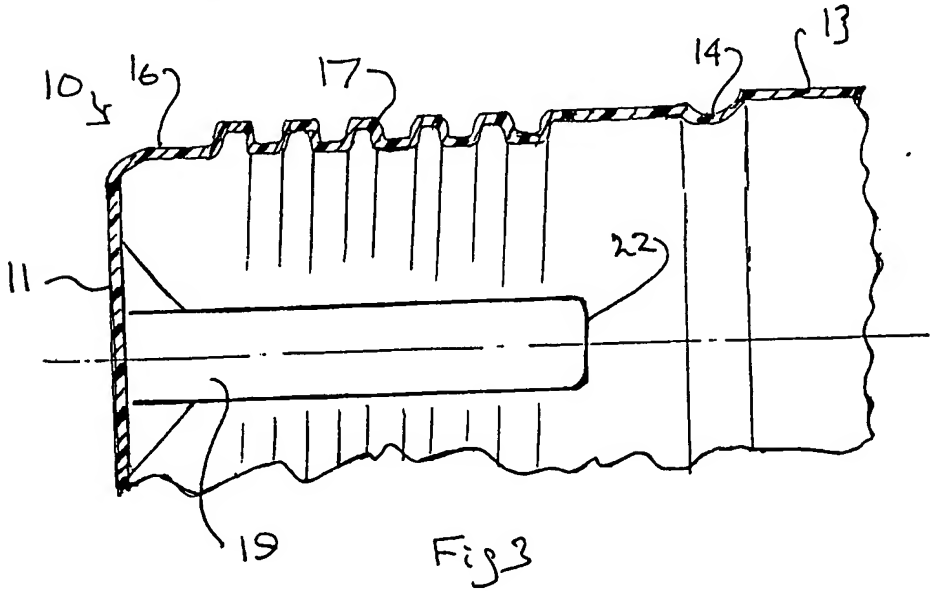

Fig 3